CHIRKINA, K.K.

Neurinoma of the pharynx. Vest.oto-rin. 18 no.5:129-130 S-O '56.
(MLRA 9:11)
1. Iz kliniki bolezney ukha, gorla i nosa (zav. - prof. A.A.Gladkov) Kishinevskogo meditsinskogo instituta.
(PHARYNX--TUMORS)

GARBER, R.I.; GINDIN, I.A.; CHIRKINA, L.A.

Twinning and annealing of nonequilibrium iron-nickel alloy of the Sikhote-Alin iron meteorite. Meteoritika no.23:45-55 '63. (MIRA 16:9)

(Sikhote-Alin Range—Meteorites)

GARBER, R.I.; GINDIN, I.A.; STOLYAROV, V.M.; CHECHEL'NITSKIY, G.G.; CHIRKINA, L.A.

Apparatus for studying the damping of low-frequency torsional oscillations. Prib. i tekh. eksp. 8 no.3:172-174 My-Je '63. (MIRA 16:9)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.
(Oscillations--Electromechanical analogies)

ACC NR: AP5027148 SOURCE CODE: UR/0126/65/020/004/0603/0607

AUTHOR: Garber, R.I.; Gindin, I.A.; Chirkina, L.A.

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR))

TITLE: Low temperature "deformation" polymorphism in lithium by the internal friction method

SOURCE: Fizika metallov i metallovedeniye, v.20, no.4, 1965, 603-607

TOPIC TAGS: lithium, phase transition, internal friction

ABSTRACT: Measurements were made by the method of damping free torsional vibrations of the samples in the temperature interval embracing the transition from a body-centered cubic lattice to a face-centered cubic lattice (78-200°K), at frequencies of 0.7, 0.8 and 1.3 cycles, in the region independent of amplitude. The logarithmic decrement of damping was taken as the measure of internal friction. The lithium samples, of a purity of 99.3%, were prepared by pressing in the mold at room temperature under a layer of kerosene for protection from oxidation. The length of the effective cylindrical section of each sample was 30 mm and the diameter 3 mm. For stress measurements, the sample was annealed for 2-3 days at 300°K, then pickled in methyl alcohol and

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UDC: 548.33:539.67

L 8811-66

ACC NR: AP5027148

cooled to the temperature of liquid nitrogen (78°K), at which temperature it does not oxidize or undergo phase transition, and was mounted in the apparatus for measurement of internal friction in the single phase state (body-centered cubic). To induce the polymorphic transition from the body-centered cubic to the face-centered cubic lattice and to investigate internal friction, part of the samples were previously deformed by torsion at 78°K up to the relative shear, 5.2×10^{-2}. The martensite nature of the "deformation" nature of the transition from a body-centered to a face-centered cubic lattice in lithium is marked in an especially clear manner in experiments on measurement of internal friction during heating of the samples to determined temperatures above and below the temperature of the reverse transitions with intermediate cooling to 78°K, as well as in a study of the frequency dependence of internal friction. Orig. art. has: 3 figures.

SUB CODE: MM,IC/ SUBM DATE: 28Oct64/ ORIG REF: 010

OTH REF: 005

BVR

Card 2/2

CHIRKINA, N.A.; POPOV, L.N., dotsent, zaveduyushchiy.

Case of superacute tuberculous sepsis with leukemoid blood reaction. Terap. arkh. 25 no.2:65-67 Mr-Ap '53. (MLRA 6:5)

1. Kafedra patologicheskoy anatomii Chkalovskogo meditsinskogo instituta.
(Tuberculosis)

CHIRKINA, T.

Use of laurel-leaf extract. Mias. ind. SSSR 32 no.1:47-48 '61.
(MIRA 14:7)

1. Buryatskiy sel'skokhozyaystvennyy institut.
(Laurel) (Spices)

CHIRKINA, T. N.

"On instances of facultative parasitism of queen bees",
Authors: A. N. Mel'nichenko, V. N. Dmitriyeva, E. A. Filimonova, and T. N. Chirkina,
(Index: third author: Filimonova, Z. A.), Uchen. zapiski Gor'k. gos. un-ta, Issue
14, 1949, p. 73-79, - Bibliog: 12 items.

SO: U-4631, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 24, 1949).

CHIRKINA, Z. P.

Some errors in the proofs of theorems in geometry. Uch.zap.Chuv. gos.ped.inst. no.7:12-29 '59. (MIRA 13:9)
(Geometry)

CHIRKUNYAN, A.G.

Experiments in establishing effective types of feeding for milk cows and their physiological aspect. Izv. AN Arm. SSR. Biol. i sel'khoz. nauki 11 no. 5:33-41 My '58. (MIRA 11:7)

1. Yerevanskiy zooveterinarnyy institut.
(Cows--Feeding and feeding stuffs)

CHIRKINYAN, A. G., Cand of Agri Sci -- (diss) "Development and Testing of Types of Fodder for Dairy Cows," Yerevan, 1959, 26 pp (Ministry of Agriculture, Armenian SSR. Yerevan Zoological and Veterinary Institute) (KL, 7-60, 109)

CHIRKINYAN, KH. M. jt. au.

Derrick construction, Baku, Azgostoptekhizdat, 1941. 187 p. (49-31783)

TN871.M44

GRIGORYAN, E.V.; KANTARDZHYAN, L.T.; CHIRKINYAN, S.S.

Luminescence of ionic forms of uranin and fluorescein. Izv.AN SSSR 24 no.6:771-775 Je '60. (MIRA 13:7)

1. Institut elektrotekhniki Akademii nauk ArmSSR.
(Uranin)
(Fluorescein)
(Luminescence)

L 9859-63 EWT(m)/BDS--RM/MAY
ACCESSION NR: AP3001357 S/0048/63/027/006/0796/0798 56 54

AUTHOR: Avetisyan, M. A.; Adamov, V. S.; Kantardzhyan, L. T.; Chirkinyan, S. S.

TITLE: Concerning protomeric forms of fluorescein and urain [Report of the Eleventh Conference on Luminescence held in Minsk from 10 to 15 September 1962]

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v. 27, no. 6, 1963, 796-798

TOPIC TAGS: fluorescein, sodium fluorescein urain, protometric transformations, fluorescein absorption, fluorescein luminescence

ABSTRACT: The protometric forms of fluorescein and its di-sodium salt uranin have been studied by many authors. It has been established from the characteristics of the absorption and luminescence spectra that in addition to the neutral molecule, there exist three ionic forms, produced as a result of protolytic reactions. At the same time the neutral molecule can be represented in two structurally different forms: lactone and quinoid. All these forms exhibit characteristic absorption and luminescence bands (the neutral molecule does not luminesce), but interpretation of the spectral data is rendered

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ACCESSION NR: AP3001357

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difficult by the fact that the pH ranges of existence of the different forms over-lap. New experimental data have been obtained on the spectra of fluorescein in dioxane solutions and uranin in potassium hydroxide solutions (1, 5, 10 and 15N). Increase of the alkali concentration above 1N results in decrease of the luminescence of the doubly charged uranin ion. With the passage of time strong KOH solutions turn blue in a few hours and then bleach after some days with complete loss of luminescence. The new results indicate that the list of equilibrium protolytic forms of fluorescein and uranin must be supplemented by two new ionic forms existing in strong alkaline solutions. The equilibrium constant for the two neutral forms of uranin and fluorescein is strongly dependent on the initial concentration of the dye. "The authors thank L. A. Gasparyan and R. G. Nazaryan for assistance in the work." Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: PH,CH NR REF SOV: 004 OTHER: 005

ja/nh
Card 2/2

L 9904-63
ACCESSION NR: AP3000417 S/0076/63/037/005/1069/1074

AUTHOR: Avetisyan, M. A.; Adamov, V. S.; Kantardzhyan, L. T.; Chirkinyan, S. S.

TITLE: Photochemical behavior of uranin in liquid and solid solutions

SOURCE: AN SSSR. Zhurnal fizicheskoy khimii, v. 37, no. 5, 1963, 1069-1074

TOPIC TAGS: uranin, saccharine, boric organophosphors, atmospheric oxygen, photochemical processes, boric phosphor

ABSTRACT: Authors attempted to explain the effect of a preliminary light excitation on the luminescent properties of saccharine and boric organophosphors containing uranin ions in various relative concentrations as an activator. The luminescence and absorption spectrums of hard sugar candies and boric beads, which were prepared from aqueous solutions of uranin at various pH and subjected to a preliminary light excitation for various lengths of time in the presence of atmospheric oxygen, were studied. Authors conclude that photochemical processes in liquid solutions as well as in boric phosphor lead to the formation of non-luminescent products of the photoreaction of uranim. In glycerine and

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saccharine phosphor with a pH of about 4, the photoproduct causing the appearance of a short-wave luminescence band is identified with the uranin cation forming from the neutral molecule as the result of photochemical process. In saccharine phosphor with a pH of about 3.35, a substantially different progress of the photochemical process was established, which led to a sharp increase in the luminescence intensity. "The authors wish to thank V. A. Arutyunyan and D. G. Petrosyan for their help in this study." Orig. art. has: 7 figures.

ASSOCIATION: iInstitut radiofiziki i elektroniki, AN Armyanskoy SSR (Institute of radiophysics and electronics, AN Armenian SSR)

SUBMITTED: 25Apr62 DATE ACQ: 19Jun63 ENCL: 00

SUB CODE: 00 NR REF SOV: 004 OTHER: 003

Card 2/2

CHIRIKOV, B.V.

[redacted]-3-4/40

AUTHORS: Bovin, V.V., Krupchitskiy, P.A., Pershin, I.I., Chirikov, B.V.

[redacted] the Method of Mean

Measurement of Primary Ionization Using the Method of Mean Gap Length in Wilson Chambers and Diffusion Chambers.

down each of these components was carried out. Measurements were carried out on the positive component. Using this method, negative ions (in this case electrons) are separated out and this is useful since the efficiency of condensation on them is always less than 100% and can fluctuate considerably. Changes in the structure of tracks during separation into the two components (Ref.8) did not occur since electronegative admixtures were very small (less than 0.5% O_2). In order to guarantee 100% efficiency of condensation only the central part of the sensitive layer of the chamber was used. The temperature was stabilized.

2. In ionisation measurements it is necessary to use those parts of tracks which do not overlap strong droplet backgrounds.

3. Good illumination of tracks is essential. The Wilson chamber was illuminated by two flash lamps type ИПК-600 and photography was carried out at an angle of 45° to the light beam on a highly sensitive 35 mm film (reduction 1:10, f:20). The diffusion chamber was illuminated continuously with the mercury lamp СВДШ-250. The photography

Measurement of Primary Ionization Using the Method of Mean Gap Length in Wilson Chambers and Diffusion Chambers.

was carried out at an angle of 30° to the light beam. The objective of the photographic camera was controlled by a coincidence scheme using Geiger-Muller tubes.
4. High contrast films and developers were used. Fine grain developers are particularly undesirable.
5. Optimum magnification must be used in examining the tracks. The authors have used a magnification of 100. The measured value of primary ionisation for argon recalculated into minimum ionisation are in agreement with the values obtained by G.W.McClure (Ref.10). Similar agreement is obtained for air and carbon dioxide. The following values were obtained for the primary ionisation:-

Air:	21 ± 1.5 ions/cm
Argon	30 ± 2 ions/cm
Carbon dioxide	28 ± 2.5 ions/cm.

There are 7 diagrams, 3 tables and 14 references, 1 Russian, 10 English, 1 French and 1 German.

SUBMITTED: October 14, 1956.

AVAILABLE: Library of Congress.

Card 3/3 1. Cloud chambers 2. Ionization-Measurement 3. Photography

Chirikov, B. V.

AUTHORS: Lomanov, M.F., and Chirikov, B.V. 120-5-4/35

TITLE: The Effect of Overlap in the Measurements of Track Density in a Bubble Chamber (Uchet perekrytiya pri izmerenii plotnosti sleda v puzyr'kovoy kamere)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.5, pp. 22 - 25 (USSR).

ABSTRACT: The possibility of measuring the ionization (track density) produced by charged particles in a bubble chamber was discussed in Ref.1 and a method for carrying out such a measurement was proposed. The aim of the present paper is to review the different methods of measuring the ionization and to give an analysis of the statistical errors involved. The track density is defined (as in Ref.1) as the initial number of nucleating bubbles per unit length of track produced by a charged particle in the liquid. If the track density is sufficiently small, it can be determined by a simple count of the bubbles on a photograph of the track. In ordinary conditions however, it is necessary to take into account random of overlap of the bubbles and thus a direct measurement of the track density is impossible. The following model is assumed. Images of the bubbles are circular and all have the same diameter D.

Cardl/3 The centres of these bubbles are randomly distributed along a

The Effect of Overlap in the Measurements of Track Density in a Bubble Chamber.

straight line with a mean density g. The distribution of the distances x between the centres of the bubbles is Poissonian and is therefore of the form:

$$w(x)dx = g.\exp(-gx)dx .$$

When overlapping occurs, a track consists of clusters and gaps shown schematically in Fig.1. The integral distribution of gap length can be derived from the above Poissonian distribution and has the form $P(l) = \exp(-gl)$. This distribution was confirmed experimentally excluding very short gaps (when l is less than D/2) which have to be rejected (Ref.1). The latter is equivalent to an effective increase of bubble size. The following methods are considered: 1) Gap distribution. The main disadvantage of this method is that statistical errors are large near the region $gD' = 1$ where D' is the effective bubble size. 2) Mean gap size. 3) Transparency of the track. This is defined as the mean ratio of the total length of all the gaps greater than l_0 and the length of the track. It is shown that

Card2/3 when gD' is less than 2 then the method of the "transparency

The Effect of Overlap in the Measurements of Track Density in a Bubble Chamber.

of the track" is most convenient, and for gD' greater than 2, the method of "number of gaps" is suitable. Fig.2 shows curves of :

$$(\delta g/g)\sqrt{\frac{L}{D'}}$$

as a function γ where $\sigma g/g$ is the statistical error in g, L is the total length of the track, $\gamma = gD' = g(D + \ell_0)$.

In this figure, Curve 1 refers to the gap density, Curve 2 - mean length of gap, Curve 3 - transparency of the track, Curve 4 - transparency of the track with rounding off, and Curve 5 - accuracy in the absence of overlap.
There are 2 figures and 9 references, 3 of which are Slavic.

SUBMITTED: March 11, 1957.

AVAILABLE: Library of Congress

Card 3/3

Chirikov, B.V.

AUTHORS: Volosok, V.I., Chirikov, B.V. 57-11-24/33

TITLE: On Compensation of Space Charge in Electron Beams. (O kompensatsii prostranstvennogo zaryada elektronnogo puchka)

PERIODICAL: Zhurnal Tekhn.Fiz., 1957, Vol. 27, Nr 11, pp 2624-2630 (USSR)

ABSTRACT: The compensation of the space charge of a cylindrical electron beam by a virtual cathode with the help of ions developping on the occasion of ionization of the residual gas is investigated. The investigation is carried out by the impulse-process by means of measuring the electric field of the beam-space-charge. For this purpose a search electrode in form of a ring was located into the anode. The observations were made by the aid of an impulse-oscillograph. The behavior of the electron beam with respect to time was investigated according to the oscillograms of the electric field of the beam and of the current flowing towards the collector. At sufficiently small amperages the usual compensation of the space charge was observed in accordance with E.G.Linder and K.G.Hernquist (J.Appl. Phys., 21, 1088, 1950). But as soon as the amperage exceeded a certain $I_{critical}$ value, the course of the oscillogram changed. The field voltage remained practically constant for some time after switching on the high voltage, but afterwards it decreased intermittently. The current flowing towards the collector, however, increased all the time in order to reach its steady value in the moment of of the jump. After the jumps the usual compensation.was observed

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On Compensation of Space Charge in Electron Beams. 57-11-24/33

in the beam. The fact that before the jump a part of the current does not reach the collector can only be explained by the presence of the virtual cathode in the beam, which reflects some of the electrons. The voltage of the electric field immediately after the jump (E_2) did not depend on the residual gas pressure and fell approximately in linearity with the increase of current. The time τ_2, in which the field-voltage jump took place, was measured. A qualitative explanation of the observed phenomena is given. There 7 figures and 5 Slavic references.

SUBMITTED: February, 12, 1957

AVAILABLE: Library of Congress.

Card 2/2

CHIRIKOV, B. V., Cand of Phys-Math Sci -- (diss) "Nonlinear Oscillations in Nearly Conservative Systems," Novosibirsk, 1959, 14 pp (Siberian Department of the Institute of Nuclear Physics, Academy of Sciences USSR) (KL,8-60, 114)

21(7) SOV/89-6-6-3/27

AUTHOR: Chirikov, B. V.

TITLE: Resonance Processes in Magnetic Traps (Rezonansnyye protsessy v magnitnykh lovushkakh)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 6, pp 630 - 638 (USSR)

ABSTRACT: The heat insulation of the plasma is one of the most important problems in the field of controllable thermonuclear reactions. One of the possible methods of insulation is the so-called adiabatic trap which is based on the conservation of the magnetic orbital moment. This moment is, however, only adiabatically invariant, it changes slowly and the life time of such a particle in the trap is limited. The suggestion of applying magnetic plugs was made by G. I. Budker (Ref 1) who also theoretically investigated the problems in this connection. Also in a number of western publications and in papers by Artsimovich and Firsov (Refs 4,6) insulation problems are dealt with. The problem of the adiabatic invariant was treated by the latter as well as by a number of western papers; Some partial results concerning this subject made in reference 7 are given. The present paper contributes to these investiga-

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tions by a mathematical treatment of the resonance between the Larmor rotation of a charged particle in the magnetic field and its slow oscillations along the magnetic lines of force (see also Andronov et al., Ref 9). Such a resonance is possible in spite of different frequencies if the slow particle oscillations are unharmonious (containing high harmonics of the fundamental frequency). The effect of the resonances is especially based on a change of the magnetic moment of the individual particles. It is demonstrated that under certain conditions these resonances may lead to a complete energy exchange between the degrees of freedom of the charged particles, and to their escaping from the trap; this is the case, however, only in the systems with "forbidden" directions of the particle velocities. Besides the traps with magnetic plugs this refers also to some systems with a compensation of the toroidal drift. The influence of the resonances on adiabatic processes which are connected with a temporary change of the magnetic field is investigated. The investigations are carried out for steady as well as for unsteady cases. A comparison of the theoretical data with the experimental ones by S. N. Rodionov (Ref 15) is shown in a table (p 637); their

agreement is regarded as satisfactory. In conclusion, it is pointed out that analogous resonance effects may occur in a plasma kept by means of a high frequency field (no energy exchange but energy change). In an appendix the author gives the estimation of the coefficients P and Q occurring in the computations. There are 1 table and 18 references, 13 of which are Soviet.

SUBMITTED: April 11, 1959

16 (1)

AUTHOR: Chirikov, B. V. SOV/20-125-5-17/61

TITLE: The Passage of a Nonlinear Oscillatory System Through Resonance (Prokhozhdeniye nelineynoy kolebatel'noy sistemy cherez rezonans)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 5, pp 1015-1018 (USSR)

ABSTRACT: The author investigates a nonlinear operator with a degree of freedom which may be described by the Hamiltonian

$$\mathcal{H} = p^2/2M + U(x, \lambda_1) + \varepsilon U_1(x, \lambda, \vartheta)$$

$$\lambda_1 = \lambda_1(\tau) \quad \lambda = \lambda(\tau, x, \dot{x}, \ddot{x}, \ldots), \quad d\vartheta/dt = \Omega(\tau)$$

The parameter λ_1 characterizes the adiabatic processes in the system, and the term with U_1 (which is periodic with respect to ϑ) characterizes the external disturbances (especially passage through resonance) as well as the dissipative and self-oscillation processes. $\tau = \varepsilon t$ denotes the "slow time" and ε - a small parameter. The method of investigating such nonlinear oscillations was investigated by two earlier papers (Refs 1, 2). Reference is also made to several other papers

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The Passage of a Nonlinear Oscillatory System Through Resonance

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dealing with this subject. However, owing to the use of numerical methods in connection with some of these investigations, and because of the character of some other papers this phenomenon has hitherto not been investigated with sufficient thoroughness. The present paper describes a simple method of deriving the solution immediately from the above-mentioned Hamiltonian, and also the passage of the nonlinear oscillator through resonance is investigated. The undisturbed system ($\varepsilon = 0$) is assumed to have a periodic solution which depends on two constants (W and φ) and also on the parameter λ_1.

$x = x(W, \theta, \lambda_1)$, $\theta = \int \omega(W, \lambda_1)dt + \varphi$, $dx/dt = \omega \partial x/\partial\theta$,

$W = p^2/2M + U(x, \lambda_1)$. In the presence of minor disturbances ($\varepsilon \to 0$) one goes over to slowly varying variables W and φ. By using $\dot{W} = \dot{\lambda}_1 \partial W/\partial\lambda_1 + [W, \mathcal{H}]$ where $[\ ,\ ]$ denotes Poisson's brackets, $\frac{dW}{dt} = \varepsilon \frac{d\lambda_1}{d\tau} \frac{\partial W}{\partial \lambda_1} - \varepsilon \frac{\partial U_1}{\partial x} \dot{x}$

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$$\frac{d\varphi}{dt} = \varepsilon \frac{\partial U_1}{\partial x} \frac{\partial x}{\partial W}\omega - \frac{\varepsilon\omega}{k} \frac{d\eta_1}{d\tau}\left(\frac{\partial x}{\partial W}\frac{\partial U}{\partial \eta_1} + \frac{\partial x}{\partial \eta_1}\right)$$ is obtained. Here the exact equations in the "slow" variables W and φ are concerned, to which the general method of averaging is then applied. Adiabatic processes are not investigated here. The rather voluminous equations of first approximation are explicitly written down. The most simple case is the rapid passage through resonance. In this case the solution of the aforementioned equations of first approximation may be expressed in the well-known manner by means of Fresnel's integrals. In first approximation scattering occurs only with respect to energy. Next, the case of a single resonance is investigated. There are two qualitative kinds of passage through resonance. The first is characterized by a limited oscillation of the phase ψ and by multiple passage through resonance. In the case of the second, the oscillator passes only once through resonance. This case is more closely investigated, and the asymptotic variation of oscillator energy is calculated.

The Passage of a Nonlinear Oscillatory System Through Resonance

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There is no continuous transition to the steady case. The effects of second order may in general also cause a qualitative variation of the solution. The author thanks G. I. Budker and Yu. F. Orlov for interesting discussions and useful advice. There are 1 figure and 10 references, 8 of which are Soviet.

PRESENTED: January 14, 1959, by M. A. Leontovich, Academician

SUBMITTED: December 19, 1958

Card 4/4

S/057/60/030/05/07/014
B012/B056

AUTHORS: Volosov, V. I., Chirikov, B. V.

TITLE: The Theory of the Skin Effect in Transient Operation

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 5, pp. 508 - 511

TEXT: A special case of transient operation, viz. the switching-on of a periodic magnetic field is investigated. In the simplest one-dimensional case for a semi-space ($x > 0$) occupied by a semiconductor, formula (1) holds. This problem is solved by means of the Duhamel integral, and formula (2) is obtained (Ref. 1). This formula is transformed, after which it consists of 2 summands. The first summand is the solution of the skin effect problem in stabilized operation. The second summand has the function $\varphi(\tau)$, which satisfies formula (3), representing the equation of the enforced oscillations of the harmonic oscillator. In the appendix to the present paper $\varphi''(\tau)$ is estimated. For transient operation formula (6) is obtained. In the case of a constant magnetic field being switched-on, transient operation may be expressed by the exact formula (8) (Ref. 4).

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The Theory of the Skin Effect in Transient Operation

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B012/B056

By means of formulas (6), (7), and (8) transient operation may be analyzed if an arbitrary periodic magnetic field is switched on. It is pointed out that here the described method is easily applicable to analogous cases in other fields, e.g. to heat conductivity problems.
There are 1 figure and 4 Soviet references.

SUBMITTED: November 28, 1957

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L 13627-63 EWA(k)/EWP(k)/EWT(1)/BDS/3W2/EEC(b)-2/ES(t)-2 AFFTC/
ASD/ESD-3/RADC/APGC/AFWL P:-4/Pi-4 JHB/WG/K/EH/IJP(C)
ACCESSION NR: AP3003134 S/0056/63/044/006/2016/2022

AUTHOR: Chirikov, B. V.

TITLE: Kinetics of induced Mossbauer radiation

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2016-2022

TOPIC TAGS: Gamma laser, Mossbauer radiation, line width

ABSTRACT: A theoretical study is made of the kinetics of induced Mossbauer radiation in an infinite crystal under conditions where the characteristic time of the process is much less than the line width. The study is aimed at investigating the feasibility of one type of Gamma laser, consisting of a crystal that contains initially only excited nuclei (a pure nuclear isomer). Only the initial stage of the development of the Gamma wave in the crystal is studied. It is pointed out that the maximum of the wave will move with a very low velocity, proportional to the line width, and that the main difficulty in the realization of such a Gamma laser is to find an extremely narrow Mossbauer radiation. It is noted in conclusion that an x-ray laser operating on electronic transitions is

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hardly feasible because of the absence of metastable levels and the consequent difficulties in producing a significant concentration of excited atoms. Orig. art. has: 1 figure and 19 formulas.

ASSOCIATION: Institut yadernoy fiziki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Nuclear Physics, Siberian Department, Academy of Sciences, SSSR)

SUBMITTED: 07Jan63 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 008 OTHER: 004

Card 2/2

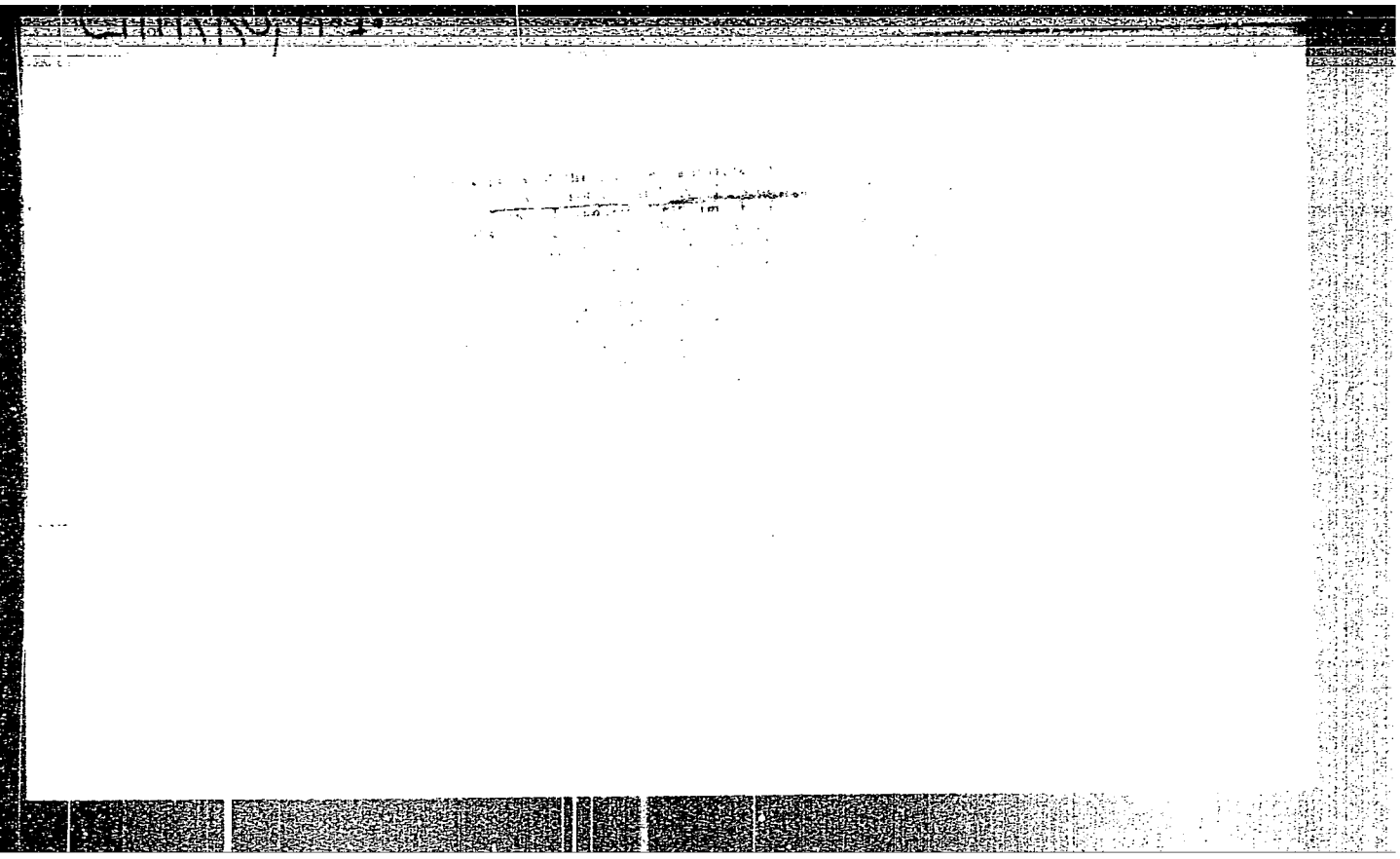
VOLOSOV, V.I.; CHIRIKOV, B.V.

Skin effect in transient operation. Radiotekh. i elektron. 9 no.5:910 My '64. (MIRA 17:7)

ADAMOV, V.S.; KANTARDZHYAN, L.T.; OGANOV, E.A.; CHIRKINYAN, S.S.

Effect of reabsorption on the damping of the phosphorescence of boric phosphors stimulated by light pulses. Dokl. AN Arm. SSR 41 no.2:88-92 '65. (MIRA 18:11)

1. Institut radiofiziki i elektroniki AN ArmSSR. Submitted March 10, 1965.



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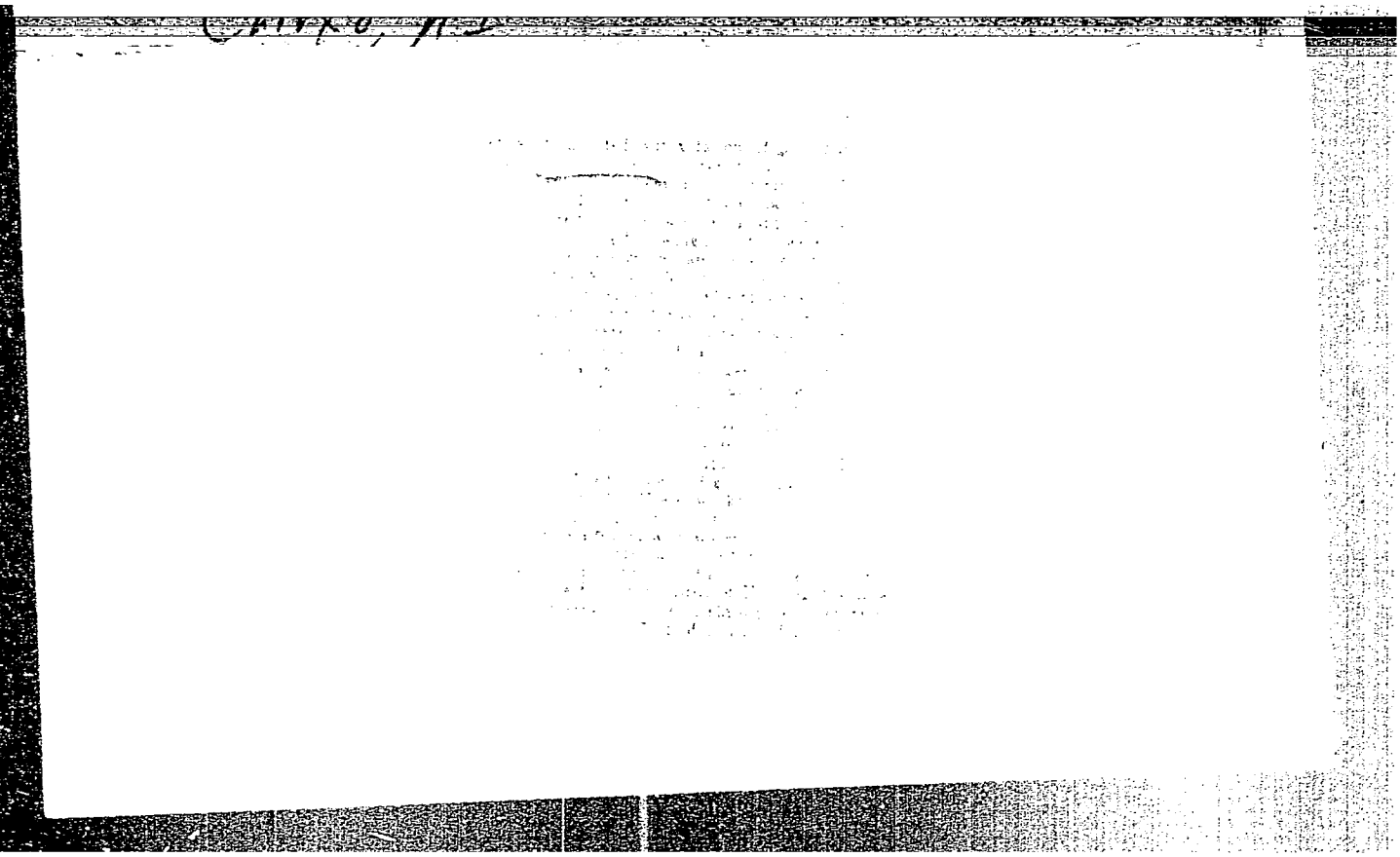

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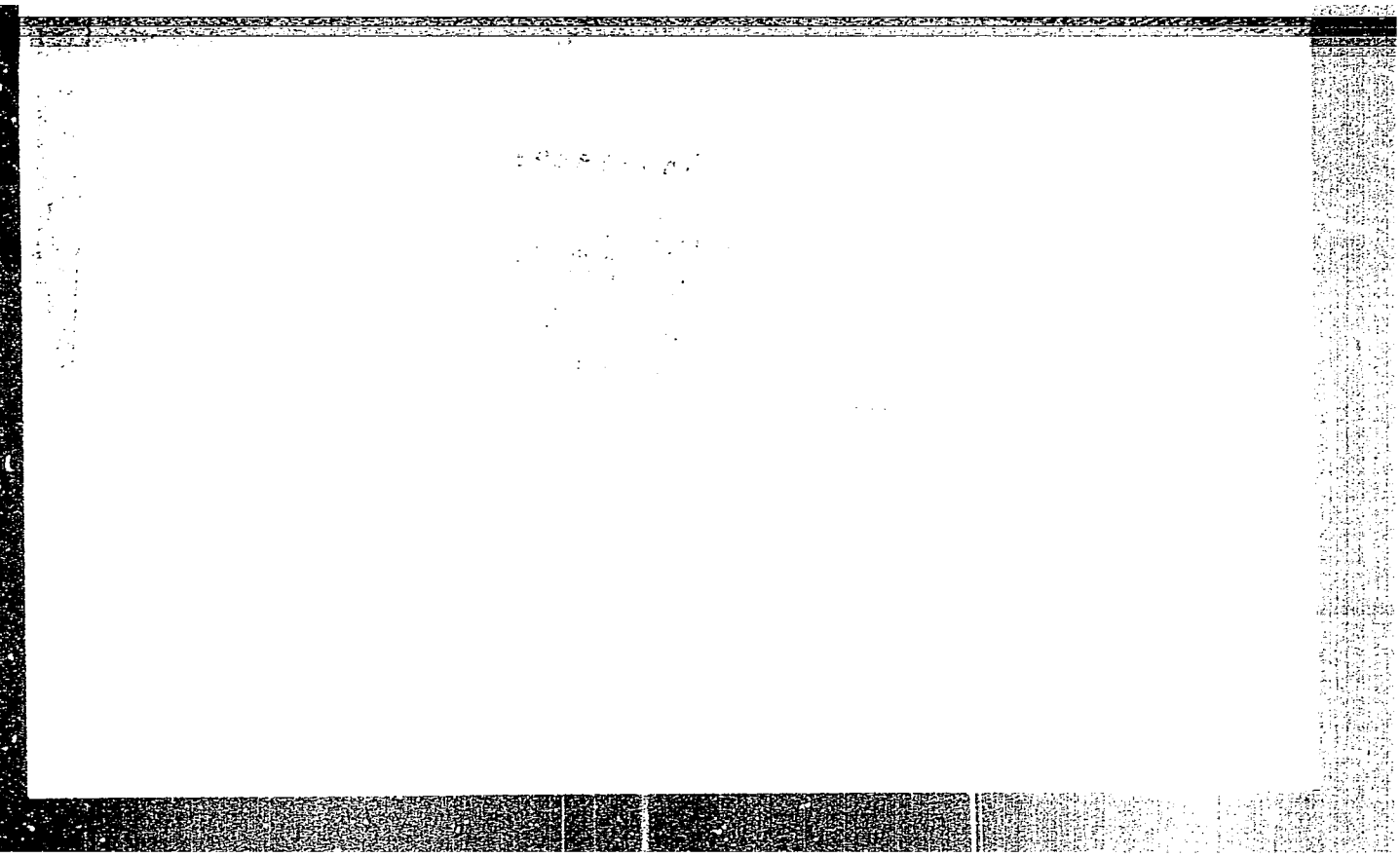

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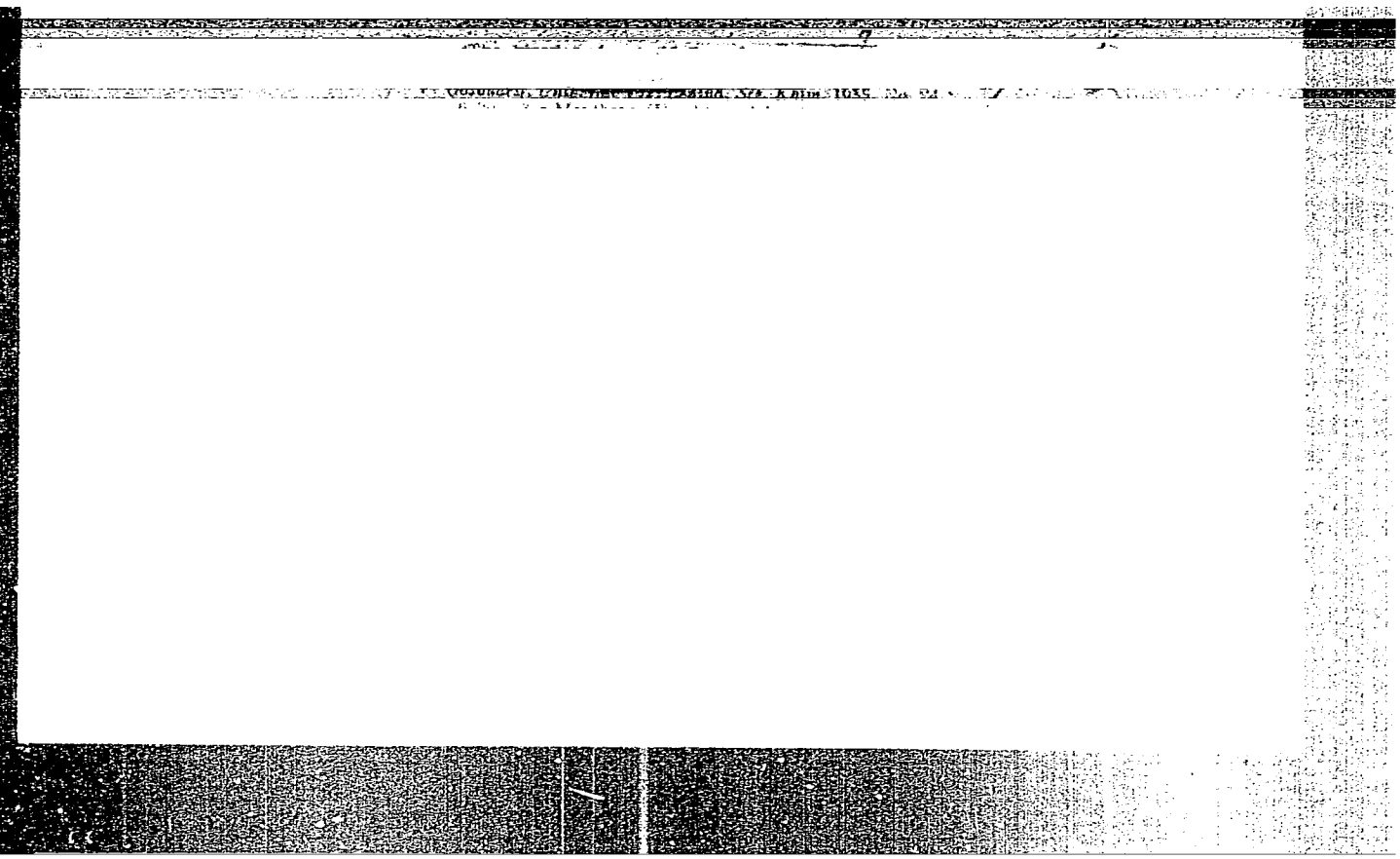

YEREFEYEV, B.V.; CHIRKO, A.I.

Autooxidation kinetics of 3-carene. Uch.zap. BGU no.29:3-14 '56. (MIRA 11:11)

(Oxidation) (Carene)

YEROFEYEV, B.V.; CHIRKO, A.I.

Initiators and peroxide products of 3-carene autooxidation.
Uch.zap. BGU no.29:15-22 '56. (MIRA 11:11)
(Oxidation) (Carene)

CHIRKO, A.I.; MARDYKIN, V.P.

Autooxidation kinetics of various hydrocarbons. Uch.zap. BGU no.29:23-35 '56. (MIRA 11:11)
(Oxidation) (Hydrocarbons) (Chemical reaction, Rate of)

YEROFEYEV, B.V.; CHIRKO, A.I.; TERENT'YEVA, Yu.N.

Investigating the products of the autooxidation of cyclohexylbenzene.
Uch.zap.BGU no.42:127-137 '58. (MIRA 12:1)
(Cyclohexane)

CHIRKO, A.I.; MOYSEYCHUK, K.L.

Kinetics of the autooxidation of 1,3-cyclohexadiene. Uch.zap.BGU no.42:281-292 '58. (MIRA 12:1)
(Cyclohexadiene)

YEROFEYEV, B.V.; CHIRKO, A.I.; TERENT'YEVA, Yu.N.

Kinetics of liquid-phase autoxidation of phenylcyclohexane.
Dokl. AN BSSR 3 no.6:244-248 Je '59. (MIRA 12:10)
(Hexane) (Oxidation)

YEROFEYEV, B.V. [Yeraffeu, B.V.]; CHIRKO, A.I. [Chyrko, A.I.]

Dimer products of the autoxidation of unsaturated hydrocarbons.
Vestsi AN BSSR. Ser.fiz.-tekh.nav. no.1:51-56 '60. (MIRA 13:6)
(Hydrocarbons) (Polymers) (Oxidation)

36322
S/580/61/000/000/001/016
A057/A126

5,3700

AUTHORS: Yerofeyev, B.V., Chirko, A.I., Uskov, I.I.

TITLE: Investigation of 1-phenylcyclohexene-1 autoxidation kinetics and the products

SOURCE: Yerofeyev, B.V. and I.G. Tishchenko, eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy, Minsk, 1961, 3 - 14

TEXT: Products of the autoxidation of 1-phenylcyclohexene-1 have been investigated before by H. Hock, and M. Siebert, but not the kinetics. The latter were studied for the first time in the present paper and a new compound was isolated from the primary autoxidation products. The oxidation was carried out at 50°C during 30 h by an earlier described method. The products of autoxidation were separated and results corresponding to those by Hock and Siebert obtained. The new product was prepared by thermal destruction of the autoxidation product and preliminarily determined as 1-phenylhexene-2-ol-6-on-1 $CH_2OH-CH_2-CH_2CH =$ $= HC-CO-C_6H_5$. Experiments on autoxidation kinetics carried out with fresh and stored (2 weeks) samples in the presence of 1% cobalt stearate showed no difference, and a maximum of the autoxidation rate after about 110 min. The influence

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Investigation of 1-phenylcyclohexene-1....

of 14 different initiators was tested and the greatest effect obtained with cobalt and manganese butyrate and cobalt stearate, which increased the maximum rate of autoxidation by 6 - 9 times. Kaolin, manganese, cobalt, and lead formiates showed no effect. The influence of the concentration of the initiator was studied with cobalt stearate, manganese butyrate, and lead dioxide admixtures (0.25 - 4%) and it was observed that the oxidation degree increases to a content of 1% cobalt stearate or 0.5% manganese butyrate respectively, while for lead oxide a steady increase can be observed with the concentration. The dependence of the autoxidation rate on the cobalt stearate concentration can be described by the following equation:

$$V_m = \frac{a\,[u]}{1 + b[u]}$$

(V_m = rate, a = constant = 0.01042, b = constant = 1.364, [u] = concentration of the initiator). The effect of concentration of 1-phenylcyclohexene-1 on the rate of autoxidation was investigated in benzene solutions containing 0.5% cobalt stearate, and linearity according to $V_m = KC^{1.63}$ was observed. The influence of temperature was studied at 40, 50, and 60°C in presence of 1% cobalt solution and from the data obtained the activation energy was calculated with 16,400 cal/mole. The relatively high kinetic order of 1.63, is explained by the present authors

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with the assumption of complex formation between the hydrocarbon and the initiator. The new product is assumed to be 1-phenylcyclohexene-2-ol-6-on-1 since the formation of carbonyl and hydroxyl groups is observed at destructions of tertiary hydroperoxides. Therefore, the primary formed hydroperoxide could be 6-phenyl--6-hydroperoxide-cyclohexene. Formation of the latter is caused by intermediate isomerization of the phenylcyclohexenyl radical. Thus, further investigations of the products of autoxidation of 1-phenylcyclohexene-1 would be of interest. There are 5 figures and 4 tables.

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36323 S/580/61/000/000/002/016
A057/A126

AUTHORS: Yerofeyev, B.V., Chirko, A.I., Urbanovich, I.I.

TITLE: Products and kinetics of autoxidation of phenylcyclopentane

SOURCE: Yerofeyev, B.V. and I.G. Tishchenko, eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy, Minsk, 1961, 15 - 27

TEXT: The products and kinetics of the autoxidation of phenylcyclopentane were investigated, and for the first time the primary product of autoxidation -1-hydroperoxide-1-phenylcyclopentane- was separated and specified. Kinetics were studied in the presence of 11 different admixtures. The present investigation was of interest in connection with analogous studies on phenylcyclohexane to determine the effect of its structure on the rate of autoxidation. The physico-chemical characteristics of the phenylcyclopentane used were compared with corresponding data published by S.S. Nametkin, N.D. Zelinskiy, and Ya.I. Denisenko. Repeated distillation showed that an increased purity raises the autoxidation rate of phenylcyclopentane. The effect of the different admixtures was determined by the quantity of oxygen absorbed and the percentage of hydroperoxide formation. The highest activity wasshown by manganese and cobalt butyrate and acetate, and

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also cobalt acetate and lead dioxide. The latter showed a considerable difference as initiator in comparison with the other active admixtures, i.e., a greater amount of the hydroperoxide was accumulated in the products of autoxidation in the presence of lead dioxide and, on the other hand, the dependence of the autoxidation rate on the concentration of the initiator showed another character for lead dioxide than for cobalt stearate. At higher concentrations of lead dioxide linearity can be observed, indicating different from the other initiators, that lead dioxide does not participate in processes of chain rupture. Another important observation was made in studying the effect of phenylcyclopentane concentration on the autoxidation rate, which can be expressed by $V_m = KC3.5$ (V_m = rate of autoxidation per 1 liter solution). The relatively high order of kinetics (3.5) is explained by the present authors with complex formation of the initiator and the oxidized hydrocarbon, according to earlier investigations. The equation

$$V_m = \frac{a\,[u]}{1 + b[u]}$$

(V_m = rate of autoxidation, a and b = constants, [u] = concentration of the initiator), which was stated in earlier studies for other hydrocarbons, is valuable also for the autoxidation of phenylcyclopentane in the presence of cobalt stearate as initiator. The activation energy for the present autoxidation was found to be 16,000 cal/mole. There are 6 figures and 5 tables.

S/580/61/000/000/004/016
A057/A126

AUTHORS: Chirko, A.I., Mas'ko, A.A.

TITLE: Products and kinetics of the autoxidation of 1-cyclohexylcyclohexene-1

SOURCE: Yerofeyev, B.V. and I.G. Tishchenko, eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy, Minsk, 1961, 39 - 50

TEXT: The effect of four different initiators and their concentration, of temperature, of concentration, of 1-cyclohexylcyclohexene-1 and of its storage, on the maximum rate V_m of liquid-phase autoxidation of 1-cyclohexylcyclohexene-1 was investigated. The primary product of autoxidation was separated, the physico-chemical characteristics and structure were determined. This study was carried out to determine the position in the molecule of 1-cyclohexylcyclohexene-1 which is easiest attacked by autoxidation, since theoretically there could be several possibilities. The autoxidation product of 1-cyclohexylcyclohexene-1 was prepared without an initiator during 48 h at 50°C with a 56.9% yield and separated through sodium salts, since it decomposes in vacuum distillation. The pure hydroperoxide (n_D^{20} 1.5045, d_4^{20} 1.0250) was transformed into the corresponding alcohol in order

Products and kinetics.....

to determine the structure and the 1-cyclohexylcyclohexene-1-ol-6 obtained, proving that the primary product of autoxidation was 1-cyclohexyl-6-hydroperoxide--cyclohexene-1. Thus the autoxidation occurs easiest to the methylene group of the cyclohexene ring, which group is in the α-position in relation to the double bond and the quaternary carbon atom. Good reproducibility of autoxidation kinetics was observed in the presence of 0.5% manganese stearate (as initiator) at 50°C with 45 days stored and freshly prepared 1-cyclohexylcyclohexene-1. Tests on the activity of the initiators showed the greatest effect for cobalt stearate, some lower effect for manganese stearate, and no effect for lead dioxide and "lyuminofor Π-15" (luminophor L-15). From results obtained on the effect of temperature upon V_m the activation energy was calculated with 23,888 cal/mole. The dependence of V_m on the concentration of the initiator (manganese stearate) can be expressed by

$$V_m = \frac{a\ [u]}{1 + b\ [u]}$$

(a = 5, b = 1.7, [u] = concentration of the initiator). The effect of the concentration of 1-cyclohexylcyclohexene-1 on V_m is rather original showing a non-proportional increase of V_m until 4.5 mole/liter and a sharp decrease with a further increasing of the concentration of 1-cyclohexylcyclohexene-1. The average rate V_{av} of autoxidation depends on the concentration of 1-cyclohexylcyclohexene-

Products and kinetics....

S/580/61/000/000/004/016
A057/A126

-1 according to: $V_{av} = KC_k^n$. There are 6 figures and 5 tables.

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36326
S/580/61/000/000/005/016
A057/A126

5.3700

AUTHORS: Chirko, A.I.; Uskova, N.F.

TITLE: Products and kinetics of autoxidation of cycloheptene and the effect of the ring size on the autoxidation rate

SOURCE: Yerofeyev, B.V. and Tishchenko, I.G., eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy., Minsk, 1961, 51 - 62

TEXT: The primary product of autoxidation of cyclopentene was separated for the first time, its physico-chemical characteristics were determined and also the secondary products of autoxidation investigated. Further were investigated the kinetics of the autoxidation of cyclohexene with and without 9 different admixtures, and they were compared with cycloheptene and cyclopentene to study the effect of the ring size on the rate of autoxidation. The method of investigation was described in an earlier paper. Among the substances tested as initiators, cobalt and manganese butyrates showed the highest activity and stearates increased 3 - 10 times the percentage of oxidation in relation to runs without admixtures. Increased activity of the initiators with the same cation can be effected by increasing the number of carbon atoms in the anion of the initiator. The primary

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autoxidation product was obtained by autoxidation of cyclopentene at 50°C during 2 h in the presence of 1% manganese stearate. An analysis of the fraction boiling at 51°C/0.1 torr indicated a rather pure hydroperoxide of 1-hydroperoxidecycloheptene-2. Partial isomerization of the product is possible with the formation of minute quantities of methylcyclohexene-hydroperoxide. Dialkylperoxide and dialkyl were determined in the remainder, i.e., as secondary product of autoxidation. The formation of these substances is explained by the rupture of the chain reaction during the autoxidation of cyclcopentene. The activation energy of cyclohexene autoxidation in the presence of manganese butyrate was calculated with 16,874 cal/mole. Experiments on the effect of the concentration of the initiator on the rate of autoxidation were carried out at 50°C in the presence of 0.25, 0.5, and 2% cobalt stearate. The dependence of the maximum rate of oxidation on the concentration of cobalt stearate can be expressed by the equation $V_m = \frac{a[u]}{1 + b[u]}$, ($V_m$ - rate, a and b - constants, [u] - concentration of the initiator). Experiments on the effect of the size of the cyclene ring showed the following sequence in relation to the autoxidation rate: cyclohexene > cycloheptene > cyclopentene. The effect of the cyclene concentration on the rate of autoxidation, studied in the presence of 1% cobalt stearate, showed that the dependence of the maximum rate can be expressed by $V_m = KC^n$. There are 4 figures and 6 tables.

36327
S/580/61/000/000/006/016
A057/A126

√,3V00

AUTHORS: Chirko, A.I.; Nikonenko, M.G.

TITLE: Autoxidation of cyclohexylidenecyclohexane

SOURCE: Yerofeyev, B.V. and Tishchenko, I.G., eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy, Minsk, 1961, 63 - 72

TEXT: Kinetics and products of initiated liquid-phase autoxidation of cyclohexylidenecyclohexane (I) are investigated in present work. A method employed in an earlier investigation was used in studying kinetics. The method of N.D. Zelinskiy was used to prepare (I) from cyclohexanone. Because of the instability of (I) reproducible results of the autoxidation kinetics could be obtained only with (I) freshly distilled over metallic sodium. Manganese stearate and caprinate, as well as cobalt acetate showed the greatest activity among 8 different initiators tested in autoxidation at 70°C. However, these substances effect also a decomposition of the primarily formed hydroperoxide. The most suitable initiator for the preparation of the hydroperoxide was found to be a 0.5% admixture of manganese acetate. The obtained primary product of autoxidation was determined to be 1-cyclohexylidene-hydroperoxide-cyclohexane-2 since by thermal decomposition of the

X

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Autoxidation of cyclohexylidenecyclohexane

latter 1-cyclohexylidene-cyclohexanone-2 was obtained, i.e., decomposition occurs without rupture of cycle and evdution of CO_2. Thus, the autoxidation occurs on the secondary carbon atom of the α-methylene group of the cycle. The rate of autoxidation was studied in dependence of the concentration of the initiator, of the concentration of (I), of the temperature, and of the molar weight of the anion of the initiator. Acetic acid, formed during autoxidation from the initiator used, was not decarboxylized. It is characteristic that an increase of the concentration [u] of cobalt acetate increases the maximum V_m of autoxidation, but decreases the average rate of autoxidation. The dependence of V_m on the concentration of (I) can be expressed by $V_m = KC_m^n$. From the temperature dependence of the rate of autoxidation $\log V_m - 1/T$ the activation energy was calculated with 19,585 cal/ /mole. The increase of the molecular weight of the anion of the initiator (manganese formiate, acetate, caprinate, and stearate) causes an increase of V_m and of the oxidation degree, while the content of hydroperoxide decreases (in relation to the oxidation degree). This can be expressed by $V_m = KM$ (M - molecular weight of the anion of the initiator, $K \sim 1.7 \cdot 10^{-4}$. There are 4 figures and 5 tables.

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36337
S/580/61/000/000/016/016
A057/A126

J.3700

AUTHORS: Chirko, A.I.; Yasinskaya, O.A.

TITLE: Investigation of the kinetics of autoxidation of pinocamphane

SOURCE: Yerofeyev, B.V. and Tishchenko, I.G., eds. Zhidkofaznoye okisleniye nepredel'nykh organicheskikh soyedineniy, Minsk, 1961, 151 - 160

TEXT: Kinetics of initiated autoxidation of pinocamphane were studied in the presence of salts of aliphatic acids, or metal oxides at 65°C. The reproducibility, the effect of temperature, of the initiator concentration and of the ratio of the components in mixed initiators, of the partial pressure of oxygen and of the concentration of pinocamphane, on the rate of autoxidation were investigated. The authors obtained in an earlier work dihydropinene which showed properties similar to pinocamphane prepared by S.S. Nametkin and N.N. Dolgopolov. Hence the same structure is assumed for both substances. Pinocamphane hydroperoxide, or dialkyl-hydroxideperoxide are formed by thermal decomposition of pinocamphane according to earlier investigations of the present authors. The preparation technique of pinocamphane and the method employed in the present work was also described in earlier papers. Good reproducibility of results was obtained in autoxi-

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Investigation of the kinetics of .....

dations at 65°C with 0.5% manganese stearate (as initiator) using stored or freshly distilled pinocamphane. Among 19 investigated initiators, greatest activity was shown by cobalt stearate, butyrate, acetate and caprylate, and manganese stearate. The lowest effect was observed with the metal oxides. Rising temperature increases the maximum rate V_m of autoxidation and the activation energy in the presence of cobalt stearate was calculated with 8,460 cal/mole. Experiments carried out with mixtures of a more and a less active initiator, i.e., cobalt butyrate and lead acetate, showed that a mixture containing 50% of each substance increases the oxidation rate 32 times more than lead acetate. This is explained by a stabilizing effect of the lead ions on the generated hydroperoxide in the oxidized medium, and on the other hand by the high initiation effect of cobalt butyrate at the beginning of autoxidation. Experiments carried out with oxygen-nitrogen mixtures showed that V_m increases with the partial pressure of oxygen. The effect of pinocamphane concentration (C) on V_m was studied by varying C from 2.8246 to 5.8049 mole/liter in naphthalene solution and in the presence of 4.01 g/l cobalt caprylate and the validity of $V_m = kC + b$ estimated ($k = 0.00304$, $b = 0.0112$) for $C > 3.7$ mole/liter. The negative value of b indicates the simultaneous decomposition of the hydroperoxide during its formation. There are 4 figures and 5 tables.

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CHIRKO, A.I.

Products of liquid phase autoxidation of dicyclohexyl. Zhur. org. khim. 1 no.6:1004-1007 Je '65. (MIRA 18:7)

Belorusskiy gosudarstvennyy universitet imeni Lenina.

CHIRKO, A.I.

Autoxidation of 1-cyclopentyl-1-cyclopentene and bicyclopentyl. Zhur. org. khim. 1 no.11:1984-1987 N '65. (MIRA 18:12)

1. Belorusskiy gosudarstvennyy universitet imeni V.I. Lenina, Minsk.

CHIRKO, B.I.

Sanitation of containers and equipment at Khoyniki Canning Plant.
Kons. i ov. prom. 13 no.10:13-15 O '58. (MIRA 11:10)

1.Khoynikskiy konservnyy zavod.
(Khoyniki--Canning industry--Sanitation)

CHIRKO, B.I.

Processing cucumbers at the Khoyniki Canning Factory. Kons.i ov.prom. 14 no.2:15-16 F '59. (MIRA 12:3)

1. Khoynikskiy konservnyy zavod, Belorussiya.
(Khoyniki--Cucumbers--Preservation)

CHIRKO, V. I.

S/185/60/005/002/015/022
D274/D304

AUTHORS: Val'ter, A.K., Zalyubovs'kyy, I.I., Klyucharyev, O.P., Pasichnyk, M.V., Pucherov, M.M. and Chyrko, B.I.

TITLE: Elastic scattering of protons with an energy of 6.8 MeV by isotopes of chromium, nickel and copper

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 5, no. 2, 1960, 270-272

TEXT: The angular distribution of elastically scattered protons by the isotopes: Cr^{52}, Cr^{53}, Ni^{58}, Ni^{60}, Ni^{62}, Cu^{63}, Cu^{65} is investigated. Up to now it has not been easy to formulate a theoretical interpretation of the effects related to proton scattering; hence, the importance of gathering and systemizing relevant data. The protons with energy 6.8 ± 0.1 MeV were obtained on the cyclotron of the Physics Institute of the UkrSSR. The proton scattering was detected by a scintillation spectrometer. The measurements were conducted from 20° to 160°, at angle intervals of 5°. The investi-

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gated mixtures contained at least 98% of the isotope, with the exception of Cr^{53} whose proportion was 95%; they were in the form of thin (3 - 4 μ) plates. The results of the investigations are given in 2 figures, where the angular distribution is plotted as the ratio of an experimental differential cross-section to the Rutherford cross-section. The results show a noticeable shift in the position of the maxima and minima of the angular distributions. It is noted that such a shift is observed for small differences in the mass number of the scatterer nucleus. Thus the distribution curve for Cu^{65} is shifted by 5° with respect to that of Cu^{63}. Such a result is in good agreement with data on proton scattering with 19.6 MeV energy. The form of the distribution curves for both Cu isotopes is entirely identical. The results for Cr isotopes are different. The differential cross-section in the region of large angles is considerably greater for Cr^{52} than for Cr^{53}. It is noted that it would be even much greater if the energy separation in the experiment would be higher. In the case of Ni isotopes, the distribution curve for Ni^{62} differs greatly from those for Ni^{60}. For Ni^{62} the cross section decreases considerably with increasing angles larger

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than 120°. The angular distribution for Ni^{58} and Ni^{60} is in the main similar to that for natural isotope mixtures; this is not unexpected. The observed considerable difference in scattering by Ni isotopes, which may be related to various degree of absorption, is somewhat unexpected, though it does not contradict the results obtained by A.P. Klyucharev and N.Ya. Rutkevich (Ref. 3: ZhETF, 1, 1960). There are 2 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: M.K. Brussel, I.H. Williams, Phys. Rev., 114, 525, 1959.

ASSOCIATION: Instytut fizyky AN USSR (Physics Institute AS UkrSSR) Fizyko-tekhnichnyy instytut AN USSR (Physico-technical Institute AS UkrSSR)

SUBMITTED: November 19, 1959

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S/048/60/024/007/006/011
B019/B060

AUTHORS: Pasechnik, M. V., Pucherov, N. N., Chirko, V. I.

TITLE: Angular Distribution of Protons in the Inelastically Scattered by Chromium and Nickel Isotopes

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 7, pp. 874-876

TEXT: This is the reproduction of a lecture delivered at the 10th All-Union Conference on Nuclear Spectroscopy held in Moscow from January 19 to 27, 1960. Investigations of the inelastic scattering of 6.8-Mev protons on chromium and nickel isotopes were conducted with the cyclotron belonging to the institute mentioned under Association. The target was placed in the center of the reaction chamber at an angle of 45° to the incident beam. The proton scattering was measured with a scintillation counter. The method applied has already been described in a previous paper (Ref. 1). Proton groups belonging to the first excited nuclear states of the Cr^{52} and Ni^{58} isotopes were satisfactorily separated by the arrangement employed. The measurement of the differential partial cross section was made possible

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by the use of targets concentrated to at least 95%. Fig. 1 is a graph depicting the energy spectrum of the protons scattered by Cr^{52}, while Figs. 2 and 3 show the angular distributions of the protons scattered by Cr^{52} and Ni^{58}. The nuclei were in the first excited state (1.45 Mev, 2^+). An analysis of the angular distribution revealed that at energies near 7 Mev, inelastic scattering gives rise to a compound nucleus. Estimates of the differential partial cross section yielded 30 millibarn steradian for Ni^{62}, 20 millibarn steradian for Ni^{60}, and 10 millibarn steradian for Ni^{58}. These cross sections belong to the excited levels 1.45 Mev (Ni^{58}), 1.33 Mev (Ni^{60}), and 1.17 Mev (Ni^{62}) (estimates made in the angular region between 140 and 160°). There are 3 figures and 5 references: 2 Soviet, 2 US, and 1 Japanese.

ASSOCIATION: Institut fiziki Akademii nauk USSR
(Institute of Physics of the Academy of Sciences UkrSSR)

CHIRKO, V.I.

83575
S/056/60/038/005/008/050
B006/B070

24.6510

AUTHORS: Val'ter, A. K., Zalyubovskiy, I. I., Klyucharev, A. P., Pasechnik, M. V., Pucherov, N. N., Chirko, V. I.

TITLE: Angular Distributions of 6.8-Mev Protons Elastically Scattered by Chromium-, Nickel-, and Copper Isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1419-1423

TEXT: The authors have determined the angular distribution of 6.8-Mev protons elastically scattered by $Cr^{52,53}$, $Ni^{58,60,62}$, and $Cu^{63,65}$. (6.8±0.1)-Mev protons were obtained from the cyclotron of the Institut fiziki AN USSR (Institute of Physics of the AS UkrSSR). The scattered protons were recorded by a scintillation spectrometer which consisted of a CsI(Tl) crystal, a photomultiplier of the type ФЭУ-29 (FEU-29), and a 50-channel pulse-height analyzer of the type АИМА-1 (AIMA-1). Measurements were made between 20° and 160° every 5°, the angles being determined with an accuracy of 0.3°. Depending on the thickness of the target, the energy resolution of the scintillation spectrometer was 4-6%.

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The energy spectrum of the scattered protons was taken for each angle of measurement. The differential scattering cross section was determined in the center-of-mass system. Free films of 3 - 5 μ thickness, enriched in the isotope to be studied to 93-99% served as targets. The compositions of the targets are given in a table. For a majority of the investigated nuclei, the energy resolution of the scintillation spectrometer was adequate to separate the group of inelastically scattered protons from that of elastically scattered protons. One of these energy spectra (Cr^{52}) is shown in Fig. 1. In this spectrum taken at 90° the first level (1.44 Mev) is distinctly marked; this group of protons can be well separated from the elastically scattered protons. The groups of protons related to the excitation of the lowest levels, 0.54 and 1.01 Mev, of the Cr^{53} nucleus can make a significant contribution to the elastic scattering, particularly for large scattering angles, because the high-energy resolution is inadequate. The angular distribution of elastically scattered protons for the two chromium isotopes and E_p = 6.8 Mev is shown in Fig. 2. The first excited states of $Ni^{58,60,62}$ are at 1.44, 1.33, and 1.17 Mev, respectively. The proton groups corresponding to these levels can be easily separated from the group of

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elastically scattered protons. The angular distribution curves for Ni^{58} and Ni^{60} show analogous behavior, the curve for protons scattered from Ni^{62} deviates considerably from the former two (Fig. 3). The angular distributions and cross sections for the two copper isotopes show again analogous behavior; only, as for chromium, the curve for the heavier isotope is slightly (5°) shifted toward smaller angles. It is found that in order to obtain good agreement between theory and experiment, one must take into account, in the optical model, not only the spin-orbit interaction of the incident nucleon but also the effect of the shell structure of the nucleus on scattering. There are 4 figures, 1 table, and 12 references: 5 Soviet, 6 US, and 1 Japanese.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: November 17, 1959

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38091
S/638/61/001/000/013/056
B105/B110

24.6600

AUTHORS: Pasechnik, M. V., Pucherov, N. N., Totskiy, I. A., Chirko, V. I.

TITLE: Dispersion of medium-energy nucleons and the optical nuclear model

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 103 - 106

TEXT: The authors studied the angular distributions of elastically scattered 6.8-Mev protons and 2.8-Mev neutrons. The protons were obtained from the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR). The scattered protons were recorded with a scintillation spectrometer consisting of a CsI(Tl) crystal, an ФЭУ-29 (FEU-29) photomultiplier and an electronic recorder. Due to the energetic resolution of the instrument (3.5 - 4%) the group of elastically scattered protons can be separated from that of the inelastically scattered protons. The angular distribution of elastically scattered protons was measured between 20 and 160°. Bi, Pb, Sn, Cd, Ag, Zn, Cu, Ni, Co, Fe, or Al were used as targets. Nuclei whose Coulomb barrier allowed the incident protons to

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Dispersion of medium-energy nucleons ...

enter the range of action of the nuclear forces showed deviations of the experimental cross section from the Rutherford cross section (Fig. 1). The reaction $D(d,n)He^3$ served as neutron source (bombardment of heavy ice by 130-kev deuterons). The scattered neutrons were measured in an 11-atm methane chamber with collecting electrode (25 - 105°). It was found that the angular distributions of elastically scattered neutrons strongly differ also for elements with approximately equal atomic weight. A variant of the optical model with diffuse surface is suggested, with a potential $V(r) = \{1 + \exp[(r-R)/a]\}(V + iW)$, where V, W, R, a are the model parameters according to R. D. Woods, D. S. Saxon (Phys. Rev., 95, 577, 1954). The results of calculations on the basis of this model were in good agreement with the experimental data (Fig. 3). Experiments on proton scattering from separated isotopes (Ni^{58}, Ni^{60}, Ni^{62}, Cr^{52}, Cr^{53}) made together with A. P. Klyucharevskiy and I. V. Zalyubovskiy also gave different angular distributions which are explained by the shell structure of the nucleus. To gather experimental material further experiments of this kind are being conducted in the authors' laboratory. There are 3 figures and 11 references: 4 Soviet and 7 non-Soviet. The four references to English-language publications read as follows: Bromly, D. A.,

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Dispersion of medium-energy nucleons ...

Wall, N. S. Phys. Rev., 102, 1560, 1956; Waldorf, W. F., Wall, N. S. Phys. Rev., 107, 1602, 1957. Glassgold, A. E., Cheston, W. B., Stein, M. L., Schuldt, S. B., Erickson, G. W. Phys. Rev., 105, 1207, 1957. Jastrow, R., Harris, J. Doklad na Vtoroy konferentsii po mirnomu ispol'zovaniyu atomnoy energii (Report at the Second Conference on the Peaceful Uses of Atomic Energy) Geneva, 1958.

ASSOCIATION: Institut yadernoy fiziki AN USSR (Institute of Nuclear Physics AS UkrSSR)

Fig. 1: Angular distribution of elastically scattered 6.8-Mev protons. Legend: abscissa: θ°, c.m.s; ordinate $\sigma(\theta)_{exp}/\sigma(\theta)_{Rutherford}$.

Fig. 3: angular distribution of neutrons elastically scattered from Fe, Sn, and Bi. Dashed lines: experiment, full lines: calculation. Legend: abscissa: θ°_{lab}; ordinate: $\sigma(\theta)$ barn/sterad.

Card 3/A3

PASECHNIK, M.V. [Pasichnyk, M.V.]; ORLENKO, B.F.; PROKOPENKO, V.S.; CHIRKO, V.I. [Chyrko, V.I.]

Scattering of protons by tin isotopes. Ukr. fiz. zhur. 6 no.3:425-426 My-Je '61. (MIRA 14:8)

1. Institut fiziki AN USSR, g. Kiyev.
(Protons—Scattering)
(Tin—Isotopes)

PASECHNIK, M. V.; PUCHEROV, N. N.; CHIRKO, V. I., Kiev

"Isotopic effects and polarization in the elastic scattering of protons."

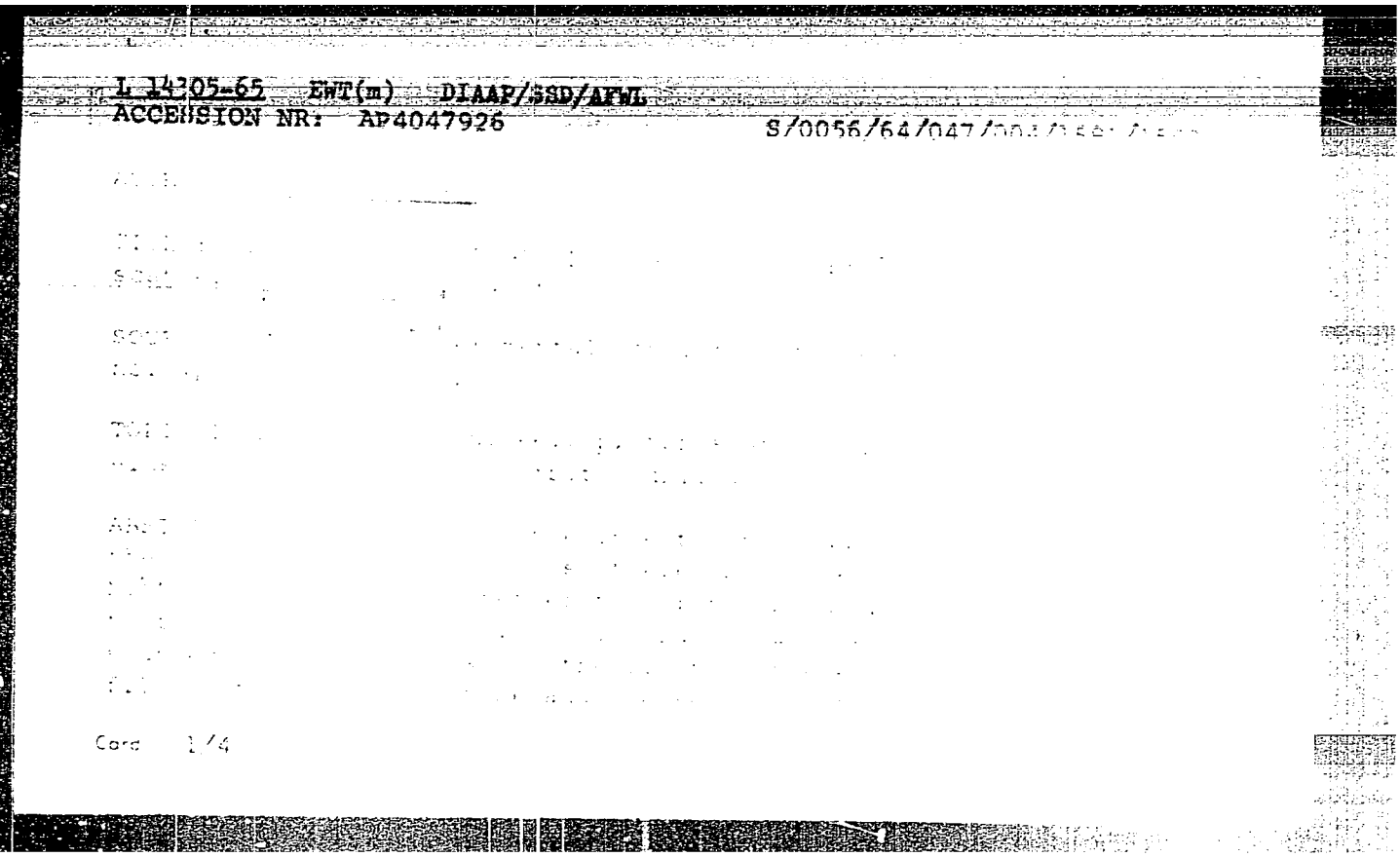
report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308820015-4"

PASECHNIK, M.V. [Pasichnyk, M.V.]; CHIRKO, V.I. [Chyrko, V.I.]

Polarization of 6.9 Mev. protons elastically scattered on nickel isotopes. Ukr. fiz. zhur. 9 no.5:576-577 My '64. (MIRA 17:9)

1. Institut fiziki AN UkrSSR, Kiyev.



L 14205-65 EWT(m) DIAAP/SSD/AFWL
ACCESSION NR: AP4047926 S/0056/64/047/

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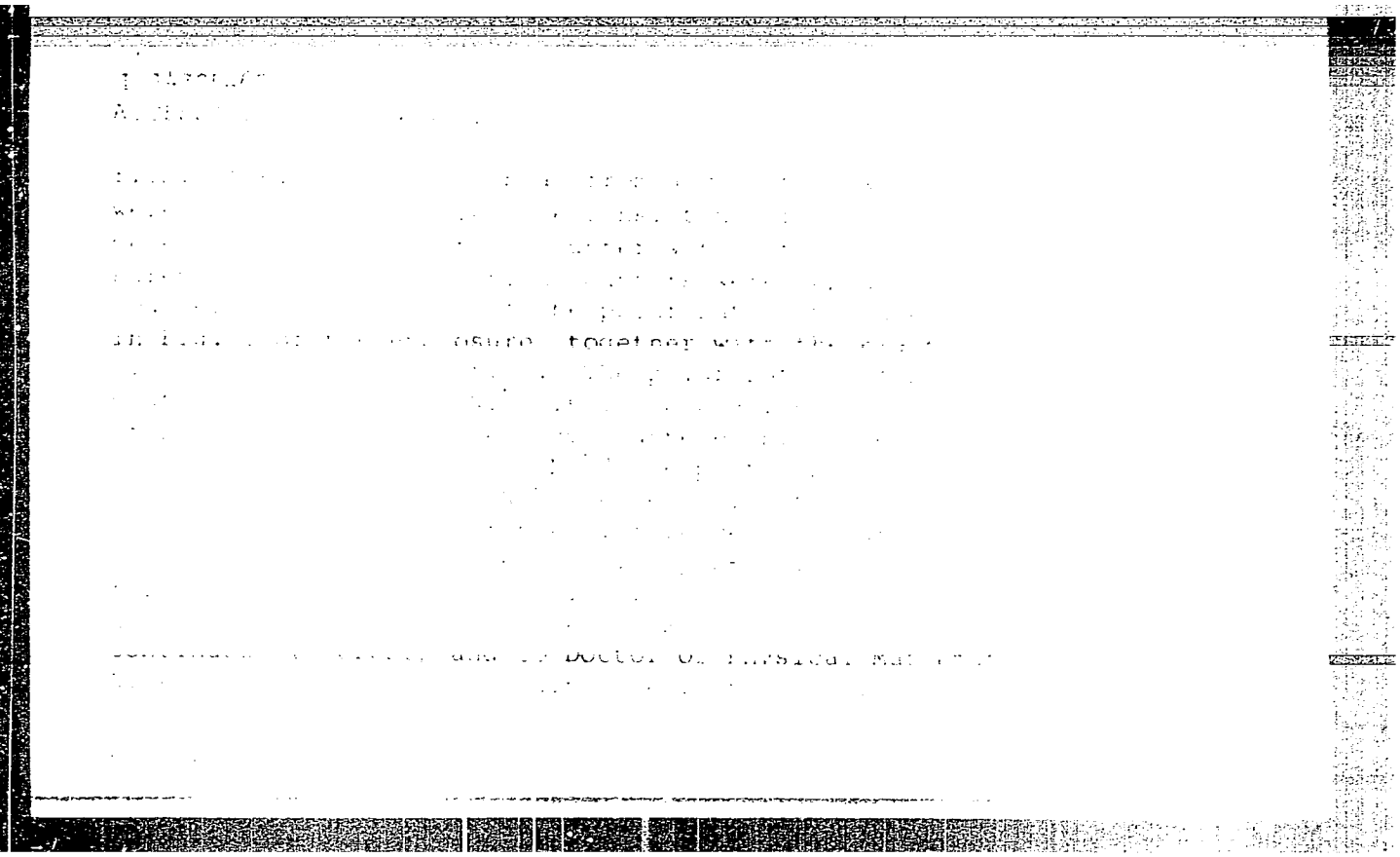

L 14305-65
ACCESSION NR: AP4047926

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L 14305-65

ACCESSION NR: AP4047926

ENCLOSURE: 01

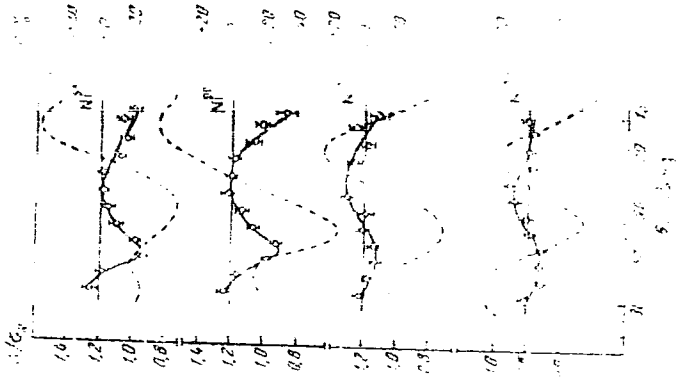

Fig. 1. Angular distributions of elastic scattering and

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CHIRKOV, A. (Leningrad)

Cellulose from wood and chips. Plan. khoz. 41 no.1:73-75 Ja'64.
(MIRA 17:2)

FROLOV, Vladimir Alekseyevich; CHIRKOV, A., red.; SHLYK, M., tekhn. red.

[On the banks of our river]Na beregakh rodnoi reki. Moskva, Mosk. rabochii, 1962. 117 p. (MIRA 15:8)
(Moskva River)

SHALAYEVA, Z.; CHIRKOV, A.; KNYAZEV, Yu.

Letters to the editor. Obshchestv.pit. no.11:43 N '62.
(MIRA 16:1)

1. Chlen soveta kluba zheleznodorozhnikov, Alatyr' Chuvashskoy ASSR (for Shalayeva). 2. Nachal'nik Velikolukskogo otdela rabochego snabsheniya Oktyabr'skoy zheleznoy dorogi (for Chirkov).

(Restaurants, lunchrooms, etc.)

CHIRKOV, A.A., kapitan-leytenant

The "Foreign military chronicle" collections. Mor. sbor. 46 no.10:94-96 O '63. (MIRA 18:12)

CHIRKOV, A. A. AND SERGEI PETROVICH SYROMIATNIKOV

Parovozy; obshchii kurs konstruktsii i elementy teorii, Dop. v kachestve uchebnika dlia in-tov zhel-dor. transporta. Moskva, Transzheldorizdat izdat, 1949. 692 p. illus.

(Locomotives; general course in design and elements of theory.)

DLC: TJ605.S9

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953

CHIRKOV, A. A. et al.

"Locomotives (2nd Edition), by A. A. Chirkov et al. Moscow State Transport Railway, 1953, 695 pp, 572 illustrations.

"This is a text for students of mechanical faculties of Russian transport institutes. The first part (pp.64) covers Russian locomotive history and gives details of engines built from 1901 to 1953, followed by general performance considerations. The second most important and thorough part (pp.303) deals with the boiler design and size determinations as evolved by Siromietnikov and more recently Belokon. This part is a most up-to-date and thorough exposition of Russian locomotive boiler practice illustrated by numerous test results and detailed boiler calculations. The treatment of the front end (blast pipe, etc.) is somewhat sketchy. The third Part (pp. 180) considers the engine proper (stresses in running gear), thermal and mechanical efficiency, balancing and valve gear. The fourth part (pp. 80) is devoted to frame design, a rather over-simplified treatment of running through curves, and problems of derailment, bogie design, stresses in rails and suspensions. The design of tenders with particular reference to condenser tenders and its auxiliary equipment is dealt with in the next part (pp. 62) whilst future possibilities of improving thermal and mechanical performance are considered in the final part (pp. 23). The numerous component design examples are illustrative of Russian practice only and refer to class F.D., I. S., S. O., L (built between 1931 and 1946), the 1 - 3 - 3 - 1 (1949) and 1 - 5 - 1 type OR (1952) locomotives. The book is well written and illustrated and gives a good up-to-date account of Russian practice which should be of interest to all concerned with design and performance of locomotives in general and their boilers in particular."

CHIHKOV, A.A., prof.

Using gas turbines in locomotives. Trudy RIIZHT no.21:5-57 '57.
(Gas turbines) (Locomotives) (MIRA 11:6)

CHIRKOV, A.A., prof., doktor tekhn.nauk

Specific case of convective heat transfer. Nauch.dokl.vys. shkoly; mash.i prib. no.1:62-67 '58. (MIRA 12:1)

1. Predstavleno kafedroy "Konstruktsii i remont lokomotivov" Rostovskogo-na-Donu instituta zheleznodorozhnogo transporta.
(Heat--Transmission)

CHIRKOV Prof A.A.

AUTHORS: Chirkov, Prof.A.A. and Bogoslovskiy, Ye. G., Engineer. 30-4-4/24

TITLE: **The Effect of Gas-Turbine Cooling Upon the Efficiency of the Installation.** (Vliyaniye okhlazhdeniya gazovoy turbiny na K.P.D. GTU).

PERIODICAL: Teploenergetika, 1958, No.4, pp.23-28 (USSR).

ABSTRACT: The efficiency of a gas-turbine installation can be increased by raising the gas temperature at the turbine inlet. However, except in aircraft turbines, the lack of heat-resistant steels makes it necessary to limit the inlet temperature. On industrial and mobile gas-turbine installations a limit of 700 - 750°C applies even when working on engine fuels. When working on fuel oil or crude, the inlet temperature must be reduced to 600-650°C to avoid vanadium corrosion. For many years designers have been trying to cool the working parts of gas-turbines. Little has been published on the losses that result from cooling the stages. Prof. V. V. Uvarov, proposed a formula to determine the reduction in available heat-drop that results from cooling losses, though he did not give a detailed derivation or explain the assumptions made. In calculating the cooling of turbines it is most important

Card 1/5 to determine correctly the heat-transfer coefficient from

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the gas to the blade. A good deal of work has been published about this matter; the results of various authors are plotted in Fig.1 as graphs of Nusselt's coefficient against Reynolds number. However, all the tests were on flat stationary rows of blades; the heat-exchange conditions on the rotating blades of a gas-turbine are very different, and heat-transfer coefficients can be 40% higher than on stationary blading. It is of considerable importance in the development of cooled gas-turbines to develop a method for allowing for the cooling loss and to establish general design trends. The author of this article, in attempting to follow the derivation of Uvarov's formula, took another path which gave different relationships and different results for the influence of cooling, particularly for high values of the ratio τ. This is the ratio of the temperatures of the gas before entering the turbine and before entering the compressor. This work is then reviewed and the inherent assumptions are stated. Fig.2 shows a T - S diagram of a gas-turbine cycle without artificial cooling of the working parts. An expression is given for the thermal

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efficiency. The removal of heat from the gas whilst it is being expanded may be represented as a stepwise temperature reduction. The T - S diagram given in Fig.3 shows this stepwise reduction for one row of nozzles and one row of blades of a reaction turbine; the effect of cooling is represented by an area on this graph. The continuous process of cooling is similarly represented in the T - S diagram in Fig.4. An expression is then given for the internal efficiency of the turbine, and a further expression for the reduced efficiency consequent upon cooling. In designing a gas-turbine the temperature drop of the gas when the blades are cooled may be calculated for each separate stage. A formula is given to obviate this laborious process. Specific designs are then worked out to compare different methods of finding the change in efficiency that results from cooling. The calculation is made for a simple single-shaft gas-turbine unit without regenerator. The calculation is made as if for air, with no allowance for products of combustion. The relationship between the specific heat and temperature

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was taken from the data of M. P. Vukalovich and I. I. Novikov. Bamnert's formula was used to determine the coefficient of heat-transfer from gas to blade. Graphs can then be made of the change in efficiency with cooling as functions of various parameters. Graphs of the internal efficiency of a turbine with the optimum amount of pressure increase, determined for the condition of maximum efficiency, are plotted in Fig.5 and corresponding curves for the maximum work output appear in Fig.6. It will be seen that with both methods of calculation there is a pronounced maximum at some definite value of τ. This optimum depends on a number of factors, and particularly on the ratio of the blade velocity to the gas velocity. There is a value of τ beyond which further increase of this velocity ratio reduces the efficiency. If our method is compared with that of Prof. V. V. Uvarov it is found that at moderate values of τ the losses are about the same with both methods of calculation. At higher values of τ the losses due to cooling calculated by the present method are greater than reached by Uvarov's method, but by both methods there is an optimum value of τ above

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which the efficiency falls. A similar relationship was published for calculating the efficiency of turbines cooled by the injection of water into the gas flow. The results of calculations of this kind are given in Fig.7. The problem of cooling the working parts of gas-turbines calls for all-round reduction in the heat-transfer surfaces. With high gas temperatures and artificial cooling of the working parts it is necessary to develop new arrangements of gas-turbines with much smaller surfaces in contact with gas. Radial turbines with internal or peripheral gas-delivery present a number of constructional advantages. Besides being of smaller surface they would probably offer an easier means of introducing the coolant.
There are 7 figures and 8 references - 7 Russian, 1 English.

ASSOCIATION: Rostov Institute of Transport Engineers.
(Rostovskiy Institut Inzhenerov Transporta).

AVAILABLE: Library of Congress.
Card 5/5

CHIRKOV, [illegible] prof.; STEPANOVSKIY, B.S., insh.

Predominant method of transmitting heat in internal combustion engine cylinders. Trudy RIIZHT no.21:96-111 '58. (MIRA 11:6)
(Gas and oil engines)

S/112/59/000/013/026/067
A002/A001

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 13, p. 36, # 26412

AUTHOR: Chirkov, A. A., prof.

TITLE: The Theory of Ribs and Needles of Circular Profile

PERIODICAL: Tr. Rostovsk. in-ta inzh. zh.-d. transp., 1958, No. 21, pp. 123-136

TEXT: The author presents general information on the application of ribbed surfaces in heat exchangers. He gives a new method of thermal calculations of ribs of circular profile with application of the Ri criterion and the coefficient of rib utilization. The Ri criterion shows how many times more a wall equipped with ribs of circular profile will transmit heat compared to a smooth wall with the same coefficient of heat emission. A thermal calculation of a rib with the calculation of Veron (France) is given. It is pointed out that the heat emission theory of needles of circular profile is analogous to the theory of ribs. The author gives an orientation estimation of the efficiency of circular ribs and needles and discusses the problem of the rib length selection. There are 12 references.

M. L. Z.

Translator's note: This is the full translation of the original Russian abstract.

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CHIRKOV, A.A., prof.

Law of changing pressure in the cross-section of free and restricted jets. Trudy RIIZHT no.21:137-155 '58. (MIRA 11:6)
(Jet--Fluid dynamics)